The life-history and gut content of Potamophylax nigricornis (Trichoptera, Limnephilidae)

By
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Abstract. During our hidroecological survey we have observed the life-cycle and gut content of a common caddisfly species. We had found the egg-masses of the animal, and after LEPNYEVA (1971) we identified the five larval stages.

The investigated Trichoptera species is a univoltin organism. Larvae occur both in creeks with stone and among plant detritus. Despite the ubiquitous occurrence of *Potamophylax nigricornis*, many details of larval life history are unknown. We provide much of this missing information through both field and laboratory studies.

Investigations have been done in two creeks near the village Törökmező in the Mountains Börzsöny between 1986-1989. One of them contains shallow water, but never completely dries. The other one springs at Fehér-forráscsoport (White Spring Group), is permanent and also flows into the stream Malomvölgyi.

We have found detailed descriptions of the larval stages in several basic works (LEPNYEVA, 1971; MACAN, 1973; MALICKY, 1983; MORETTI, 1983; ROZKOSNY, 1980; STEIMANN, 1970; ULMER, 1909).

Material and methods

We had caught the larvae and the pupas with hand and water nets and we preserved some of them in 70 % alcohol. The mass of eggs and the live animals among wet fallen leaves were taken to the laboratory.

Original stream water and air-freshened running water was used for rearing the larvae. The individual larva population were kept in water of 15-16° C in plastic containers containing 8 liter. Water in conteners was changed daily.

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Results and discussion

Life-history

The adults emerge at the end of April or the beginning of May. The gelatinous egg masses (Fig. 1) can be found in the stream in the middle of May. The diameter of egg masses is 8 mm and each contains 116-120 eggs. They can mostly be found near the shore or on the under side of stones, or on decaying leaves. In some places, there are 3-4 of them right next to
each other.

The larvae in the first stage assemble on branches. In each aggregation, we often find over a hundred larvae. During the second and third stages, they scatter in the spring and afterwards rarely can be found more than 3-4 individuals in one place. The larvae derived from their amphibious life-style can be found mostly in the piles of leaves near the shore.

Five larval stages were demonstrated (Fig. 2) but because of the special case-building strategy, it is not possible to give definite case-forms for different stages.Before forming pupas, for the prevention of being swept away, they glue larger flat stones to the posterior side of cylindrical cases, and this makes them heavier. They seal the opening of the cases with limestone fragments and form pupas in these cases.

At the original living place, the pupas appear in the middle of February or at the beginning of March. Both of their ends are sealed with limestone fragments.

In opposition to LEPNYEVA (1971), we did not come across pupas fixed to the bedding at the living site studied by us. Under natural circumstances the animals do not form pupas in groups. However, under experimental circumctances, abscence of building materials, we observed phenomena opposing the preceeding, too.

In the laboratory, pupation lasts for 14-21 days, in nature the duration of it is 1-1.5 month, because the water temperature is usually cooler in the spring.

After the adults had emerged, the cast skin was mostly found in dry places on the side of the container in laboratory, which shows that the moult takes place on the land.

Gut content

In the stream bed oak and beech leaves had been found in large numbers. There was a difference in the proportion of leaves found in the water, there was by far less oak then beech leaves.

In the preference experiments, oak had disappeared completely in a day and there was little missing from beech leaves. If the larvae only come by beech leaves, then they first of all consume the younger, thinner leaves. In experimental circumstances the larvae feed during the whole year, and only in the spring shortly before becoming pupas stop consuming food.

These leaf fragments were defined from the intestines of larvae collected on field, and of those brought up in experiments.

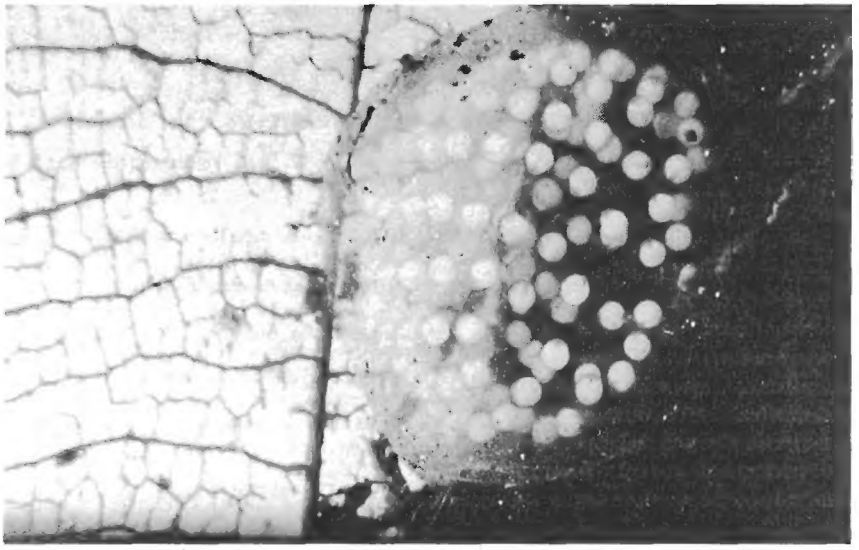

Fig. 1. The gelatinous egg masses of *Potamophylax nigricornis*

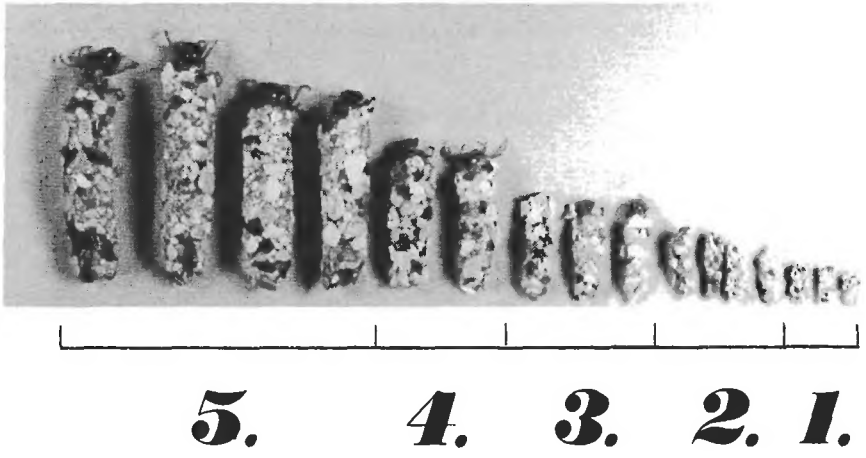

Fig. 2. *Potamophylax nigricornis*, larval stages

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